UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RANDALL K. HOLMES, MICHAEL G. JOBLING, JOHN H. ELDRIDGE, BRUCE A. GREEN, GERALD E. HANCOCK, and JOEL A. PEEK

Appeal 2007-4177
Application 09/806,370
Technology Center 1600

Decided: December 11, 2007

Before DONALD E. ADAMS, LORA M. GREEN, and RICHARD M. LEBOVITZ, *Administrative Patent Judges*.

ADAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal under 35 U.S.C. § 134 involves claims 1, 2, and 13. Of the remaining pending claims, the Examiner has indicated that claims 3, 43, and 44 are allowable; and claims 4-11, 14-17, 28-37, and 39-42 "would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims" (Answer 2). We have jurisdiction under 35 U.S.C. § 6(b).

INTRODUCTION

The claims are directed to an antigenic composition. Claim 1 is illustrative:

1. An antigenic composition comprising

(a) at least one antigen from a pathogenic organism selected from the group consisting of a bacterium, a virus, a fungus and a parasite; and

(b) an effective adjuvanting amount of a mutant cholera holotoxin, wherein the mutant holotoxin has reduced toxicity compared to a wild-type cholera holotoxin, and has an amino acid which replaces the deleted glutamic acid which naturally occurs at position 29 of the mature A subunit of the wild-type cholera holotoxin, wherein said amino acid is other than aspartic acid, and wherein said mutant holotoxin enhances the immune response in a vertebrate host to said antigen.

The Examiner relies on the following prior art references to show unpatentability:

Corine Glineur et al., "Importance of ADP-Ribosylation in the Morphological Changes of PC12 Cells Induced by Cholera Toxin," 62 (10) *Infection and Immunity*, 4176-4185 (1994).

The Examiner presents the following rejection:

Claims 1, 2, and 13 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Glineur.

We affirm.

DISCUSSION

The claims have not been argued separately and therefore stand or fall together. 37 C.F.R. § 41.37(c)(1)(vii). Therefore, we limit our discussion to representative claim 1. Claims 2 and 13 will stand or fall together with claim 1.

Claim 1 is drawn to an antigenic composition. The composition comprises two ingredients:

(a) at least one antigen from a pathogenic organism selected from the group consisting of a bacterium, a virus, a fungus and a parasite; and

(b) an effective adjuvanting amount of a mutant cholera holotoxin. According to Appellants' Specification "the term 'effective adjuvanting amount' means a dose of the CT-CRM[1] mutant . . . which is suitable to elicit an increased immune response in a vertebrate host" (Specification 10: 5-9).

Claim 1 places three additional limitations on the mutant holotoxin. Specifically, the mutant holotoxin:

1. has reduced toxicity compared to a wild-type cholera holotoxin,
2. has an amino acid which replaces the deleted glutamic acid that naturally occurs at position 29 of the mature A subunit of the wild-type cholera holotoxin, with an amino acid that is not aspartic acid, and
3. enhances the immune response in a vertebrate host to the antigen set forth in part (a).

[1] According to Appellants' Specification "CT-CRM" is defined as a mutated cholera toxin (Specification 1: 30-31 and 4: 9-10).

The Examiner finds that Glineur anticipates claim 1. Glineur teaches a mutation (M13ctxE29Δ) wherein the codon for Glu-29 was deleted (Glineur 4179: col. 1, ll. 50-51). As illustrated in Glineur's FIG. 2, by deleting the codon for Glu-29, the remaining portion of the carboxy-end of the protein is shifted up one amino acid position, thereby placing a tyrosine at amino acid position 29 of the molecule (Glineur 4179: FIG. 2; Answer 5). Thus, Glineur teaches a mutant holotoxin that has an amino acid which replaces the deleted glutamic acid which naturally occurs at position 29 of the mature A subunit of the wild-type cholera holotoxin, with an amino acid that is not aspartic acid, as is required by Appellants' claim.

Table 1 of Glineur teaches that this mutant holotoxin has reduced toxicity compared to a wild-type cholera holotoxin (Glineur 4181: Table 1; Answer 4).

Glineur teaches that this mutant holotoxin was present in the supernatant of culture medium along with two anti-CTX (cholera toxin) reactive polypeptides (Glineur 4181: col. 2, ll. 14-22; Answer 4), which we find are antigens from a pathogenic organism, the *Vibrio cholera* bacterium (Glineur 4176, col. 1, ll. 1-3). Since Glineur teaches that the composition comprises two anti-CTX reactive polypeptides, we find that Glineur teaches an antigenic composition.

Thus, Glineur teaches a composition that comprises two ingredients:

(a) at least one antigen from a pathogenic organism; and

(b) a mutant cholera holotoxin.

Glineur does not expressly state that the composition has an effective adjuvanting amount of a mutant cholera holotoxin or that the mutant cholera holotoxin enhances the immune response in a vertebrate host to an antigen

as is required by Appellants' claim 1. However, the Examiner finds that since the prior art mutant holotoxin meets all of the structural characteristics of the mutant holotoxin in Appellants' claim 1, these functional characteristics of the mutant holotoxin set forth in claim 1 would be an inherent property of Glineur's mutant holotoxin (Answer 5).

Anticipation requires the disclosure, expressly or inherently, of all the limitations of a claimed invention in a prior art reference. *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987) ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."). The Examiner has established that Glineur either expressly or inherently describes each and every element of Appellants' claim 1.

"[W]hen the PTO shows *sound basis* for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 708 (Fed. Cir. 1990) (emphasis added). Accordingly, the burden is on Appellants' to establish that Glineur's composition is not the same as the composition set forth in claim1.

Appellants assert that Glineur "does not teach that the Glu at position 29 could be replaced with an amino acid other than Asp or that the same would provide a cholera toxin mutant with the properties necessary (including reduced toxicity) for use as an adjuvant in an antigenic composition" (Br. 18). For the reasons set forth above, Appellants' assertion that Glineur's deletion mutant does not have reduced toxicity compared to the wild-type toxin is incorrect. As to Appellants' assertion that Glineur does not teach that the deletion mutant enhances the immune response in a

vertebrate host to the antigen, it is Appellants' burden to demonstrate that Glineur's deletion mutant does not inherently have this property. The assertion of Appellants' attorney is not sufficient. *Meitzner v. Mindick*, 549 F.2d 775, 782 (CCPA 1977).

Appellants assert that the two anti-CTX reactive polypeptides present in Glineur's composition "are **not** recited to be antigens to be adjuvanted by the mutant cholera toxin in question" (Reply Br. 7). There is no evidence on this record to suggest that the two anti-CTX reactive polypeptides are not antigenic, or would not be capable of eliciting an immune response. It seems quite clear that since the two polypeptides are reactive with an antibody (see Glineur: 4177, col. 1 under heading "Antisera") they are antigenic. Further, with regard to Glineur's deletion mutant's ability to enhance the immune response in a vertebrate host to the antigen, it is Appellants' burden to demonstrate that Glineur's deletion mutant does not inherently have this property since the mutant holotoxin meets all other structural characteristics required by claim 1.

Appellants assert that Glineur's "deletion mutant is **not** the subject of Appellants' claims (Br. 19). According to Appellants, "[t]he pending claims of Appellants' invention require that the Glu at position 29 be deleted and an amino acid ***other than Asp*** be inserted in place thereof" (*id.*). It may be that Appellants are under the impression that claim 1 requires the "substitution" of Glu at position 29 for another amino acid other than Asp. *Cf.* Appellants' method claim 43 which requires "a substitution which replaces the glutamic acid which naturally occurs at position 29 of the A subunit of the wild-type cholera holotoxin with an amino acid other than aspartic acid" (claim 43). *See also* Appellants' assertion that "[i]t is only Appellants' disclosure that

provides the teaching and support for successful use of an amino acid **substitution *other than Asp*** at wildtype position E29 to create a mutant cholera holotoxin useful as an adjuvant in an antigenic composition" (Reply Br. 6). There is, however, no requirement in claim 1 that the Glu at position 29 be *substituted* with another amino acid other than Asp. Claim 1 simply requires that the Glu at position 29 be deleted and "replaced" with another amino acid other than Asp. Glineur's deletion mutant fulfills this requirement.

Appellants' arguments with regard to Glineur's E29D mutant (Br. 19; Reply Br. 8) are off point as the Examiner is not relying on Glineur's E29D mutant, but instead relies on Glineur's teachings regarding the E29Δ mutant.

In sum, we are not persuaded by Appellants' arguments.

Accordingly, we affirm the rejection of claim 1 under 35 U.S.C. § 102(b) as being anticipated by Glineur. Claims 2 and 13 fall together with claim 1.

CONCLUSION

In summary, we affirm the rejection of record.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

Ssc:

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